P16

Clinical diagnosis of potentially reversible cartilage degeneration using optical coherence tomography

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Purpose: This bench to operating room study was conducted to determine whether Optical Coherence Tomography (OCT) can be used clinically to diagnose potentially reversible early cartilage degeneration.
Methods and Materials: Polarized OCT was used to image articular cartilage with surfaces appearing intact to arthroscopic surface imaging in human cadavers, in human osteochondral tissues, and clinically during knee arthroscopy. The OCT images were graded based on the presence or absence of OCT form birefringence. For clinical study, polarized OCT was used arthroscopically in 19 human subjects (10 males and 9 females) ranging in age from 24 to 80 years. Twelve individuals were treated for degenerative medial meniscus tears and seven individuals for other intra-articular pathologies.
Results: Human cadaver study confirmed reproducibility of OCT imaging and grading based on changes to cartilage OCT form birefringence. Using osteochondral tissues, metabolic studies show that cartilage without OCT form birefringence had reduced ability to increase proteoglycan synthetic activity in response to Insulin Growth Factor-1 (IGF-1). The bench data further show that IGF-1 insensitivity in cartilage without OCT form birefringence was potentially reversible. Clinical results show more prevalent loss of OCT form birefringence in cartilage of human subjects older than age 50 and in those with degenerative medial meniscus tears, two groups with higher rates of osteoarthritis.
Conclusions: The clinical data combined with the laboratory data showing that loss of cartilage OCT form birefringence identifies potentially reversible early cartilage metabolic incompetence suggests that OCT may permit clinical diagnosis of early human cartilage degeneration at a potentially treatable stage.

P17

Clinical performance and radiographic appearance do not correlate in patients with unicompartimental osteoarthritis in the knee joint treated with high tibial open wedge osteotomy- a prospective clinical and radiographic study

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Purpose: The high tibial open wedge osteotomy (HTOWO) in varus knees is an important treatment modality in younger patients with unicompartimental osteoarthritis and varus malalignment. This prospective clinical and radiographic study evaluates the effect of HTOWO on osteoarthritic changes and clinical performance.
Methods and Materials: A consecutive group of 53 patients (35/18 male/ female, 43,8 years, SD+/-10,3) with varus malalignment and unicompartimental osteoarthritic lesions were treated with arthroscopy and HTOWO. Cartilage damage was determined intraoperatively according to the Outerbridge-Score, radiographic osteoarthritic changes by the Kellgren and Lawrence Score (KLS) and clinical performance by the Lysholm Score. Axial alignment was measured pre– and postoperatively on a digital long-leg radiograph using a PACS-workstation software. The mean follow-up was 21 months (range 12 to 30 mos).
Results: The Lysholm Score increased significantly from 71,9 (SD+/-12,2) to 89,9 (SD+/-9,2). The preoperative alignment was 5,6° varus (SD+/-3,1, range 0,8°-11,7°). The postoperative alignment was to 1,5° valgus (SD+/-3,4, range 3°varus to 5,2°valgus) with a mean correction of 7,3° (SD+/- 2,4°, range 3,8° to 12,7°). The arthroscopic Outerbridge score was 3,1 (SD+/-1,2) and verified the unicompartimental osteoarthritis, but did not correlate with the preoperative Kellgren Score. The KLS pre- and postoperatively was mean 2,0 (SD+/- 0,7)/mean 2,1 (SD+/- 0,8) and did not not change significantly during the follow-up period; this was not reflected with the increasing Lysholm Scores.
Conclusions: HTOWO increased the clinical performance of patients with unicompartimental osteoarthritis and hindered further radiographic progression of OA. However, the radiographic KLS did not reflect the grade of cartilage damage and clinical performance.

P18

A powder made from subspecies of Rose-hip may act structure-modifying in osteoarthritis.

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Purpose: In clinical trials on osteoarthritis, LitoZin™/i-flex™ a standardised Rosa canina powder produced by HybenVital, has shown anti-inflammatory and cell preserving capacity. This substudy aimed to support or deny the hypothesis that the powder may act structure-modifying in joints with osteoarthritis.
Methods and Materials: The double-blind, cross-over substudy, based on diaries, randomly included patients for treatment with either placebo or rosehip powder (5 g daily) for 3 month after which the placebo group was changed to active treatment and vice versa. Each day pain and stiffness were estimated in the morning and at noon on a 10 step categorical scale (10 worst possible). General wellbeing, quality of sleep and mood were evaluated once daily using similar scales.
Results: Diaries were available from 47 patients. Pain in the morning and pain at noon evaluated after 3 months of active treatment showed a mean decline of 0.48+/-1.49 and 0.49+/-1.40 ($p<0.020$ and $p<0.015$) respectively, as compared to placebo. The corresponding values for stiffness was a decline of 0.54+/-1.50 and 0.32+/-1.01 ($p<0.029$ and $p<0.035$) respectively. General wellbeing, sleeping quality and mood significantly improved as a result of active therapy ($p<0.016$, $p<0.009$ and $p<0.020$), respectively. A strong carry-over was detected.
Conclusions: The data support the hypothesis that the present powder may act structure-modifying and encouraged us to plan research related to cartilage.

P19

Meta-analysis of hyaluronic acid safety

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Purpose: To review the best available evidence on the safety of hyaluronic acid (HA) injections for the treatment of osteoarthritis of the knee and to establish the rate of occurrence of both mild and severe adverse events.
Methods and Materials: A systematic review of the literature and meta-analysis. Outcomes measured were rates of specific local adverse events.
Results: There are 74 interventional studies with 11,377 patients in the analysis. Fifty of the studies were randomized controlled trials (RCTs). The mean age of the patients at baseline was 63.6 years. The largest number of studies was of Synvisc (26) and Hyalgan (24). The most commonly reported local adverse event was a mild local reaction not requiring treatment. This mild reaction was reported in 46 treatment arms (3,975 patients) and occurred in 11.7% of patients (95% confidence interval 8.1 to 15.3). The rate of severe local reactions was 0.4%. Adverse events in placebo groups were rare with the exception of mild local reactions. The major difference seen in adverse events between 3 and 5 injection products is the rate of severe local reactions. [0.7% (0.2 - 1.2) for 3-injection and 0.04 (0.0-0.2) for 5-injection products].
Conclusions: The primary findings of this review indicate that adverse event rates are low across all commercially available HA products. Mild local reaction rates are comparable across products; however, the rate of severe local reactions is more pronounced with the 3-injection regimen products. Only general ranges of adverse events can be obtained due to the variability of reporting